REMARKS

In response to the Office Action mailed June 17, 2004, Applicants amend their application and request reconsideration. In this Amendment, claims 1, 9, 11, and 12 are newly cancelled and claim 29 is added. Thus, claims 5, 10, 13-24, and 26-29 are now pending.

In view of the cancellation of claims 1 and 9, the double-patenting rejection is moot. Likewise, the new claim cancellation makes moot the prior art rejections of claims 1, 9, 11, and 12.

Claim 10 is now the only pending independent claim. That claim and its dependent claims 17, 24, and 27 were rejected as unpatentable over Caulfield et al. (U.S. Patent 3,716,301, hereinafter Caulfield) in view of Kato et al. (U.S. Patent 4,924,085, hereinafter Kato). This rejection is respectfully traversed.

Reliance was placed upon Figure 6 of Caulfield which discloses a fingerprint identification apparatus that, like the apparatus of the invention, is intended to be thin, measured in a direction perpendicular to a surface upon which a finger is placed to capture an image of the fingerprint. As conceded by the Examiner, Caulfield does not disclose that the emission light emitted from the prism is in a direction opposite to the direction of incidence of the light that is incident on the prism. Further, the prism of Caulfield does not include a reflection surface that reflects the light reflected from the detection surface of the prism. In order to supply these features of claim 10, reliance was placed upon Kato. However, that reliance is misplaced.

In citing Kato, attention was directed to its Figure 12 and the description in column 8, lines 28-37. Although in some embodiments of the irregular pattern reader of Kato, for example the embodiment of Figure 1, the reader is relatively thin, the prism structure illustrated in Figure 12 of Kato cannot be thin. As pointed out by the Examiner, this structure of Figure 12 is a prism having, in cross-section, a J-shape in which multiple internal reflections of light reflected from a finger 10 occur in order to transport that light to the sensor 12.

An important objective of Kato and the invention is the production of a relatively thin fingerprint detecting apparatus. This objective is described by Kato in order to incorporate a fingerprint detector in a door or a computer keyboard. See column 2, lines 14-17 of Kato. Further, the fingerprint image capturing apparatus of Figure 6 of Caulfield is also a relatively thin structure. Modifying the structure shown in Figure 6 of Caulfield with the prism of Figure 12 of Kato, is not suggested by the prior art because the modification results in a relatively thick structure, contrary to the structure of Caulfield

and the express objective of Kato. For this reason, there is no motivation for the hypothetical modification of Caulfield with Kato, meaning that the rejection for obviousness is erroneous and should be withdrawn.

In addition, the proposed modification of Caulfield with the prism structure of Figure 12 of Kato could not produce the structure defined by claim 10. An important feature of the prism structure of the pattern reader of claim 10 is that the incident light and the emission light are parallel and are transmitted in opposite directions. Caulfield describes a pattern reader in which the incident light and the emission light are parallel, but both of these light beams are transmitted in the same direction.

It is impossible to determine directly from Figure 12 of Kato whether the emitted light incident on the sensor 12 is parallel to and opposite in direction from the incident light because the incident light is not indicated in Figure 12 of Kato. However, the figures of Kato that do indicate the direction of incident light, namely Figures 1, 9, and 10, inferentially show that the incident light enters the prism at a surface directly opposite the detecting surface. The detecting surface is the surface on which the finger is placed. Moreover, the present inventors advise that to be operative the light must enter the Kato prism opposite the detecting surface. Given that understanding, it is apparent by briefly studying Figure 12 of Kato that light incident on the finger 10 that enters the prism at surface 7-1 can never be considered to be substantially parallel to the light that is emitted through the lens portion 14 of the prism, reflected at the aperture 15a, to reach the sensor 12. Thus, even if Caulfield were somehow modified by substituting for its prism 38 the J-shaped prism of Figure 12 of Kato, there would still not be produced an apparatus in which the incident and emission light were substantially parallel and opposite in direction. Accordingly, the rejection of claim 10 and of its dependent claims 17, 24, and 27 cannot properly be maintained.

Finally, the present inventors point out that in the Kato system when the incident light is incident opposite the detecting surface, both the light reflected from a valley portion of the finger and a portion of the incident light are transmitted in the prism. As a result, the pattern of the fingerprint becomes indistinct in the valley portions. The ridge portions tend to overlap the valley portions. Thus, even if the Kato structure were adapted and used to modify Caulfield, the performance would be inferior to the performance achieved by the invention.

As noted, all claims pending in the patent application depend from claim 10 directly or indirectly. Those remaining claims not discussed above are all rejected as obvious over Caulfield in view of Kato and further tertiary patents or even in view of a

fourth patent. Those rejections are all traversed. It is apparent that those rejections all depend, for their propriety, on the principal rejection based upon the modification of Caulfield with Kato. Since that principal rejection is erroneous, none of the other rejections can be properly maintained and none requires detailed discussion.

Newly submitted claim 29 describes a feature of many of the embodiments of the invention and is supported by the embodiments illustrated in Figures 12, 19, 22, 25, and 27-33 as well as by the description of those figures appearing in the patent application.

Since, in this Amendment, no claim is amended in response to the prior art rejection of the remaining claims, any new rejection based upon newly cited prior art or a different legal cannot properly be a final rejection.

Reconsideration and allowance of all claims now pending are properly and earnestly solicited.

Respectfully submitted,

Jeffrey A. Wyand, Registration No. 29,458
LEYDIG, VOIT & MAYER
700 Thirteenth Street, N.W., Suite 300
Washington, DC 20005-3960
(202) 737-6770 (telephone)
(202) 737-6776 (facsimile)

Date: Sept 10, 2004
JAW:ves